TOUCH SCREEN USING PRESSURE TO CONTROL THE ZOOM RATIO

BACKGROUND OF INVENTION

1. Field of the Invention

The present invention relates to a touch screen, more specifically, to a touch screen that uses pressure to control the zoom ratio.

2. Description of the Prior Art

In modern society, computer systems are no longer viewed as costly toys reserved for the wealthy, but as necessities for ordinary people in their daily lives. Nowadays, nearly everyone has a computer system, such as a desktop computer, a laptop computer, or a personal digital assistant (PDA). Just as computer systems have become more advanced, computer monitors are constantly being redesigned to be thinner, lighter, and more convenient to use. One of the most recent innovations in computer monitor technology is the touch screen.

Among touch screens, there are two prior art that deal with zooming in on images. Please refer to FIG. **1**A, FIG. **1**B, and FIG. **1**C. The FIG. **1**A is a diagram of the unmagnified display **10** of a screen showing an image. FIG. **1**B is a diagram of a display **20** showing an image magnified using the first method of magnification. FIG. **1**C is a diagram of a display **30** showing an image magnified using the second method of magnification. The first prior art pertaining to magnification showed in FIG. **1**B is magnifying the upper-left section of the imaged in FIG. **1**A by a predetermined zoom ratio. If the user wants to view other parts of the image, he can control the horizontal scrolling bar **22** and vertical scrolling bar **24** to move to the part of the image he wishes to view. The second prior art pertaining to magnification shown in FIG. **1**C is magnifying the part of the imaged in FIG. **1**A under the zoom area **32** by a predetermined zoom ratio and displaying it in the zoom area **32**. The user can move the zoom area **32** to view different parts of the imaged in FIG. **1**A. This kind of operation simulates viewing the imaged in FIG. **1**A under a magnifying glass.

Among the disadvantages of the two prior arts of magnification mentioned above is that it is not convenient to use a fixed zoom ratio for all zoom functions. It can also be cumbersome to use a zoom window that cannot be easily adjusted according to the needs of the user.

SUMMARY OF INVENTION

It is therefore an objective of the claimed invention to solve the problems mentioned above by providing a touch screen that uses pressure to control the zoom ratio.

The claimed touch screen, briefly summarized, comprises a display panel, a touch sensor, and a display control. A display panel is used to display an image. A touch sensor is used to sense the intensity and position of an external force and generate a corresponding pressure signal and position signal.

A display control is connected to the display panel and the touch sensor for controlling the image and zooming in on a portion of the image according to the pressure signal and position signals. A predetermined conversion model is used to derive the zoom ratio from the pressure signal generated by the touch sensor.

These and other objectives of the present invention will no doubt become obvious to those of ordinary skill in the art after reading the following detailed description of the preferred embodiment that is illustrated in the various figures and drawings.

BRIEF DESCRIPTION OF DRAWINGS

FIG. **1**A is a diagram of the display of a screen showing an unmagnified image.

FIG. **1**B is a diagram of the display of a screen showing an image magnified using the first method of magnification.

FIG. **1**C is a diagram of the display of a screen showing an image magnified using the second method of magnification.

FIG. **2** is a function diagram of the touch screen.

FIG. **3** is a detailed structure diagram of the touch screen as illustrated in FIG. **2**.

FIG. **4** is a diagram detailing the measurement of pressure when something contacts with the touch screen.

FIG. **5** is a diagram of a linear relationship between the pressure imposed on the touch screen **100** and the zoom ratio.

FIG. **6** is a diagram of a tiered relationship between the pressure imposed on the touch screen **100** and the zoom ratio.

FIG. **7**A is a diagram of the display of a screen showing an unmagnified image.

FIG. **7**B is a diagram of the display of a screen showing an image magnified under light pressure using the first method of magnification.

FIG. **7**C is a diagram of the display of a screen showing an image magnified under greater pressure using the first method of magnification.

FIG. **8**A is a diagram of the unmagnified display of a screen showing an unmagnified image.

FIG. **8**B is a diagram of the display of a screen showing an image magnified under light pressure using the second method of magnification.

FIG. **8**C is a diagram of the display of a screen showing an image magnified under greater pressure using the second method of magnification.

FIG. **9**A is a diagram of a display of a screen showing an unmagnified image.

FIG. **9**B is a diagram of the display of a screen showing an image magnified under light pressure using the third method of magnification.

FIG. **9**C is a diagram of the display of a screen showing an image magnified under greater pressure using the third method of magnification.

DETAILED DESCRIPTION

Please refer to FIG. **2**, which is the function diagram of the touch screen. The present invention provides a touch screen **100** that interprets the pressure exerted upon it to control the zoom ratio. The touch screen **100** comprises a display panel **104**, a sensing plate **102**, a display control **106**, and a pressure detector **108**. The display panel **104** is used to display the image. The sensing plate **102** and the pressure detector **108**, which are housed in the display panel **104**, form a touch sensor. The sensing plate **102** detects the intensity and position of an external force exerted upon the display panel and generates a corresponding pressure and position signal. The display control **106** is connected to the display panel **104** and the touch sensor. The display control **106** controls the image shown on the display panel **104**, and zooms in on a portion of the image according to the position signal generated by the touch sensor. With the operation of a central processing unit (CPU) **112** and a memory **114** of a personal computer **110**, a portion of the image mentioned